ATTITUDE AND AWARENESS TOWARDS GREEN TECHNOLOGY USAGE: A STUDY AMONG STUDENTS OF BANK RAKYAT STUDENT RESIDENTIAL HALL

Thong Wai Yin[1], Mohd Zainudin Othman[2]
School of Technology Management and Logistics,
University Utara Malaysia, Kedah, Malaysia.
Email: waiyin_0910@hotmail.com[1], zainudin@uum.edu.my[2]

ABSTRACT

Green Technology is defined as the development of product, equipment and system to protect the environment. Green technology usage is important in order to reduce the amount of pollution in Malaysia. The objective of this study is to investigate the relationship between demographic, attitude, awareness and green technology usage. This study is examined within the UUM students. Quantitative method is applied on this study. The students of Bank Rakyat Student Residential Hall in UUM are been selected to be the respondents of this study. A 200 sets of questionnaire was distributed to the respondents to collect the data. The data was proceeded and analyzed by using the SPSS version 19 statistical technique. The result of correlation analysis and multiple regression analysis have shown that attitude and awareness have a significant impact on green technology usage. It can be concluded that the attitude is more important than awareness in usage of green technology. Since the amount of pollution in Malaysia is increasing in every year, therefore government should conduct the green awareness campaign to the publics in order to improve their knowledge of green technology and change their attitude on the use of green technology to protect the environment.

Keywords: Green Technology Usage, Demographic, Attitude, Awareness

INTRODUCTION

Green Technology is an achievement to develop different types of approaches and resources improvement, for develop energy to environmental friendly products (Kamaruddin Abu Bakar, 2011). Green technology is also defined as an approach towards saving earth (Soni, 2015). Ministry of Energy, Green Technology and Water (2010) indicated that Green Technology refers to the development and application of products, equipment and systems that used to protect the natural environment and resources, which minimize and reduce the negative impact of human activities. According to Tan and Lau (2010), green product is identified as a natural item or ecological item. Environmental friendly product is considered as item which not contaminate the environment or destroy the raw materials, and would be reused and preserved. It is an item that has all the ecologically substances or packing in less negative effect on the environment. On the other hand, green product mentions to item that integrates the methods in reusing or with reused substances, decreased packing or utilizing less toxic materials to lessen the effect on the environment. They found that consumers were more alerted about their daily lifestyle and the effect on nature. As a result, a customer transferred

his or her ecological concern and responsibility into an attitude on using an environmental friendly products.

Japan has carried out the environmental policy in the waste management such as waste prevention, reuse, recycling, energy recovery and disposal. 3Rs (Reduce, Reuse and Recycling) is considered as a waste management in Japan. Japan is take many opportunities on recycling. For example, industries assemble and reprocess the waste of industrial, and decrease the quantity of waste. Besides that, the attitude and behavior of Japan citizen for 3Rs is focus on plastic bag, refillable bottles, refill products and etc (Tomohiro Tasaki et al, n.d.).

STATEMENT OF THE PROBLEM

This research is conducted to investigate attitude and awareness of undergraduate students toward green technology usage. Since one of the ecological problems like pollution becomes critical nowadays (Nameghi & Shadi, 2013), therefore the green technology is useful to improve the environmental circumstance. Besides that, the implementation of green technology issues will be emphasized on this study since teenagers in the world nowadays are lack of education about the environmental issue knowledge. According to Busteed et al., the environmental awareness of adults is often formed during adolescence, an age where children begin being able to understand the challenges of environmental issues.

According to Arpita Khare (2015), consumers' awareness about the environment affects their attitude towards the using intention of green product. The consumers who are having understanding about ecological issues, obtainability of eco-brands and their impression on habitat were prefer to use the environmental friendly items than the consumers who are less conscious about ecological concerns. Furthermore, ecological friendly consumers showed enthusiasm to buy and use the green and eco-friendly items. Their pro-ecological awareness were revealed in their association with social societies involved in ecological protection. Besides that, the eco-brands and expectation in eco-brands affect the eco-brand buying and using intention among Malaysian consumers. However, consciousness of eco-brands and the buying behavior were affected by trust in green products and able to protect our nature.

LITERATURE REVIEW

Green Technology

According to Kamaruddin Abu Bakar (2011), green technology is identified as the development of product, equipment and system to protect the environment. Green technology is sustainable and have no negative impact on future generations (Metz & Seadle, 2012). The green technology field embraces a continuously evolving group of methods and materials, from techniques for generating energy to non-toxic cleaning products. The purposes to develop the green technology are sustainability, source reduction, innovation and viability. For instance, develop the fossil fuel that have been demonstrated to damage our health and conducted the innovation alternative like reuse to reduce the harm on the environment. Mahmud Shah (2011) mentioned that Malaysian are research and develop the innovative technology in the form of solar, green retailing, green chemistry and transportation fuel. An innovative technology is believed to be the next great global industry. Malaysia Government has successfully identified green technology as the emerging driver for sustainable economic growth.

Attitude

Attitude is defined as a settled state of mind or feeling about somebody or something, normally that is reflected in an individual's manner. According to Tan & Lau (2010), attitude can be identified as a mental and physical behavior which affects upon someone reaction to circumstances. Attitudes of ecological concern are established in an individual's perception. Attitude characterizes what buyers like or dislike, and the buying intention of buyers are regularly follow their natural attitudes. Nameghi (2013) stated that attitude is defined as an evaluating factor. Attitude towards a behavior is the impact of motivation, ability, experience and knowledge. According to Bello Abdullahi Birchi (2015), attitude is identified as an evaluative intervening reaction, inclining the person to show different obvious conduct. An attitude comprises of three essential segments which are informational, emotional and behavioral. Informational is defined as the convictions, learning, and data that an individual has around an item. However, emotional is identified as an individual's sentiments and qualities (constructive, unbiased or contrary) an article or thought. Behavioral is considered as a man's feeling to act particularly towards an item or thought.

Awareness

Bello Abdullahi Birchi (2015) stated that environmental awareness as critical issue of natural mindfulness. According to Syed Ali Raza Hamid et al. (2012), the level of consumers' biological mindfulness is an issue increasing much consideration around the world on account of continuously expanding degradation of the earth. In nations like America, schools, universities and colleges have planned courses in natural training to outfit their new era with higher environmental mindfulness. In this world, a continuous growth in individuals' mindfulness has made it believable to make a moderately cleaner environment in correlation to the creating scene. Residents of created nations have received environment conscious practices because of the ruining of common blessings. They have understood that the immoderate utilization of innovation is by all account not the only path for conservative and mechanical advancement and utilization of such modernity ought to be combined with sound arranging, having absolute minimum unfriendly consequences for the common habitat. One procedure which sounds to be workable among every one of the activities is the incorporation of natural courses in scholarly educational programs, which raises biological mindfulness.

Demographic

According to Rezai et al. (2012), a descriptive investigation is used to represent the population and socio-demographic profile of the respondents. For example, the information values like the demographic profiles such as age, salary level, instruction level, sexual orientation, race, local location, marital status and family unit estimate, all of them are analyzed by a graphic examination. By utilizing a research, the demographic which indicates the respondents' sex, region, age, pay, ethnic gathering, instruction level and way of life can influence the variables in a research. Fisher (2012) stated that the demographic factors such as age, education and income is need in a research. The demographic is one of the issues that use to examine the dependent variable. Demographic profiles is the main section to identify the background of someone in a research. The results of findings based on the demographic will show that which group of people has potential to be set as market target.

Green Technology Usage

One of the important factors for environmental pollution is the disposal of waste. Green technology uses renewable natural resources that never depletes (Soni, 2015). According to Tan and Lau (2010), green product is identified as a natural item or recycled item. The use of green products is friendly to the environment. It will not pollute the environment in order to

protect the nature. Rossilawaty Sheriff stated that recycling is ranked as third in the waste disposal hierarchy after reduce and reuse. To conduct the recycling, it will reduce pollution, save energy, improve cleanliness and raise the quality of life. Therefore, the recycling can be carried out to save our earth. Besides that, solid waste management (SWM) is conducted to control the waste generation, storage, collection, transfer and transport, processing and disposal of solid waste.

Tomohiro Tasaki et al initiated that Japan has carried out the environmental policy in the waste management such as waste prevention, reuse, recycling, energy recovery and disposal. 3Rs (Reduce, Reuse and Recycling) is considered as a waste management in Japan. Japan is take many opportunities on recycling. For example, industries assemble and reprocess the waste of industrial, and decrease the quantity of waste.

Relationship between Attitude and Green Technology Usage

Sinnappan & Azmawani Abdul Rahman (2011) expressed that ecological attitude refer to the people esteem judgment and it beats the people subjective appraisal of the estimation of natural insurance. A few studies have distinguished a positive relationship between attitude and green technology conducted. A study among Malaysian consumers found that consumer's attitude towards the green product can influences their buying and using intention. According to Syed Ali Raza Hamid et al. (2012), the present study investigate teenagers' attitude towards reduce, reuse and recycling, found that their attitude on the recycling is affected by their environmental awareness. Solid waste management has become one of the most discussed issues in Malaysia due to the increasing in population, economic, inadequate enforcement of waste legislation, infrastructure, and most crucially public attitudes especially teenagers.

Relationship between Awareness and Green Technology Usage

Arpita Khare (2015) described that the consumers who are having understanding about environmental issues, obtainability of eco-brands, and their concern on nature were prefer to buy and use the environmental friendly products than the consumers who are less conscious about the environment condition. Furthermore, ecological friendly consumers showed enthusiasm to buy and consume green and eco-friendly product. Their pro-ecological awareness were revealed in their association with social societies involved in ecological protection. Green products purchasing and consuming was a result of consumers' previous green trusts, previous green purchasing practices, participation in pro-ecological events, and care about the environmental circumstance. Therefore, those consumers were more willingness to purchase and use the green products. In a nutshell, green technology awareness is considered as a factor that affect the attitude of consumers to buy the green products and use it.

Relationship between Demographic and Green Technology Usage

Demographic profiles is considered as the factor that influences the purchase and using intention of the consumers towards the green products (E.E. Smith & S. Perks, 2010). According to Fisher et al (2012), the enthusiasm of consumers to buy and consume ecological friendly items is extremely related to demographics. The green product purchasing intentions are influenced by gender, age, education and income. Thus, the further research on demographics is needed. They indicated a need for study the relationships between demographics and all aspects of environmental awareness in term of understanding, approaches and performance. Sinnappan & Azmawani Abdul Rahman (2011) indicated that the demographic profiles of purchaser would be useful for advertisers to focus on their target market. The customer's green product purchasing intention has positive connection with age

and salary. A study found that more youthful eras acknowledge new or inventive thoughts better contrast with more established individuals. Result from a few studies have uncovered that male and female have huge difference in natural state of mind in which female indicated more inspirational disposition contrasted with the guys. Nonetheless, a study done as of late found there is no huge contrasts among guys and females in ecological state of mind or green obtaining conduct. They have additionally shown that demographic variables have less logical force contrast with psychographic variables. Thusly, demographic variables, for example, sexual orientation, age, ethnic gathering, instruction level, occupation and pay level will be considered in this study.

FRAMEWORK OF STUDY

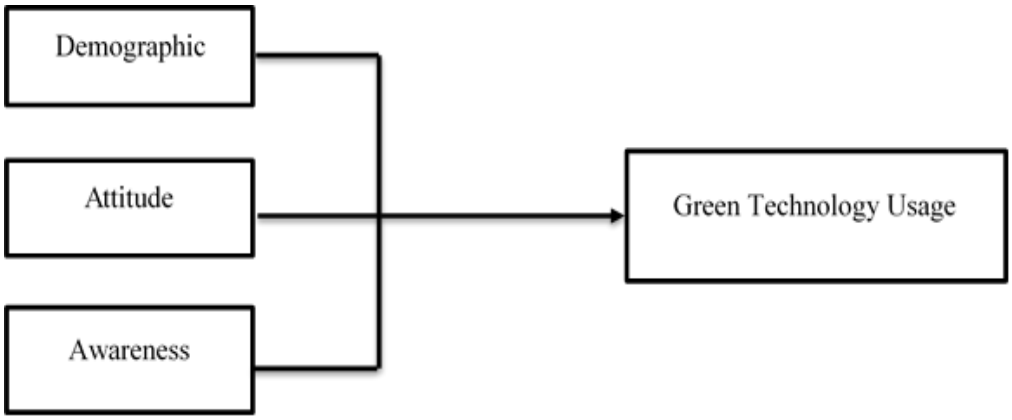

Figure 1: Research Framework of Green Technology Usage

RESEARCH METHODOLOGY

Research Design

This research embraced the quantitative methodology. The information is collected through questionnaire and analyzed by Statistical Package for Social Sciences (SPSS) version 19. In this study, green technology usage is identified as dependent variable whereas the independent variables are demographic, attitude and awareness.

Population and Sample Design

Respondents for this research are students of Bank Rakyat Student Residential Hall. 200 students will be selected as the respondents in this study.

Data Analysis Technique

All the information must be evaluated after it has been gathered from and the respondents by measurement technique. It is a system for studies the statistical information for accumulating a measurement. In this study, Statistical Package for the Social Science (SPSS) version 19 is utilized. SPSS is a good statistical PC programming for individuals to perform quantitative exploration in sociology due to the ease of use function and it is a basic point to study more progressed measureable packages. The information gathered from the questionnaire is analyzed by utilizing numerical methods such as descriptive statistics which are frequency, mean and standard deviation, reliability analysis (Cronbach's Alpha), normality test, correlation analysis and regression analysis. The relationship between the demographic, attitude, awareness and green technology usage is tested and analyzed by the regression analysis.

RESULTS

Correlation Analysis

The correlation result regarding to the green technology usage in term of attitude and awareness is shown as Table 1. According to the result of the findings, the correlation of attitude towards green technology usage ($r = 0.679$, $p < 0.01$), considered as a strong correlation and awareness towards green technology usage ($r = 0.505$, $p < 0.01$), a moderate correlation.

Table 1: Correlations of Attitude and Awareness towards Green Technology Usage

Variables	Attitude	Awareness	Green Technology Usage
Attitude	1	0.487**	0.679**
Awareness	0.487**	1	0.505**
Green Technology Usage	0.679**	0.505**	1

** Correlation is significant at the 0.01 level (2-tailed).

Based on Table 1, all the variables are significantly correlated since all are laid between the ranges of -1 and +1. The most highly correlated variable to green technology usage is attitude, and then continue with awareness.

Analysis of Relationship between Demographic and Green Technology Usage

In this study, one of the objectives is to identify the relationship between demographic and green technology usage. The relationship is analyzed by the regression analysis of SPSS. The result is shown as Table 2 below.

Table 2: Effect on Green Technology Usage Based on Demographic Factors

Variables	B	t	Sig.
Gender	0.364	4.152	0.000
Age	-0.052	-0.934	0.352
Race	-0.004	-0.032	0.975
Religion	0.073	0.720	0.472
R^2	0.088		
F	4.716		

Dependent Variable: Green Technology Usage

Based on the result, the significant of gender is 0.000 ($p < 0.05$), therefore it has a relationship between gender and green technology usage. For the other demographic factors such as age, race and religion, there are no relationship with green technology usage since the $p > 0.05$. Since R^2 is 0.088, there are 8.8% of variation with the respondents' green technology usage based on gender. The gender has a significant impact on green technology usage ($\beta = 0.364$, $t = 4.152$, $p < 0.05$).

Regression Analysis

In this study, there are two independent variables which are attitude and awareness. Therefore, multiple regression was applied to analyze the green technology usage based on attitude and awareness. Table 3 shows the summary of multiple regression results on this study.

Table 3: Summary of Multiple Regression Results

Independent Variables	B	t	Sig.
Attitude	0.543	9.859	0.000
Awareness	0.276	3.968	0.000
R^2	0.501		
Adjusted R^2	0.496		
F	99.085		
Sig.	0.000		

Dependent Variable: Green Technology Usage

Based on Table 3, a value of R, 0.708 indicates a good level of prediction. The value of R^2, 0.501 can be described as 50.1% of variation of the green technology usage (dependent variable). Then, the value of adjusted R^2 is 0.496. Besides that, the significance level of 0.000 ($p < 0.05$) indicates that the attitude and awareness have a relationship with green technology usage. However, the result shows that attitude (β=0.543, $p<0.05$) has more impact on green technology usage compare to awareness (β=0.276, $p<0.05$), since the β of attitude is more than the β of awareness. The attitude has a significant impact on green technology usage (β = 0.543, t = 9.859, $p < 0.05$).

DISCUSSION

In this study, there are 200 respondents have been selected. Half of them is male, which is 100 respondents and 50.0% respectively while 100 female respondents or 50.0% are involved. The relationship between demographic and green technology usage was analysed by using the regression analysis. Based on the result, the demographic of gender has a relationship with green technology usage with a significant value of 0.000. There are 8.8% of variation with the respondents' green technology usage based on the gender (R^2 = 0.088). The gender has a significant impact on green technology usage (β = 0.364, t = 4.152, $p < 0.05$). The result shows that the female respondents are more impact on the use of green technology compare to male respondents.

Based on the correlation analysis, the most highly correlated variable to green technology usage is attitude (r = 0.679). The positive correlation value of attitude indicates that the goodness the attitude, the more use of green technology and otherwise. Besides that, the regression analysis has been conducted to examine the relationship between attitude and awareness towards green technology usage. Based on the results, there are a relationship between attitude, awareness and green technology usage ($p < 0.05$). Attitude (β = 0.543) has more impact on green technology usage compare to awareness (β = 0.276). Therefore, the results indicates that attitude is more important than awareness in the usage of green technology.

RECOMMENDATION

Based on the results of the questionnaire, it indicates that the attitude and awareness of the respondents have an impact on the green technology usage. The awareness on the usage of green technology can be improved by given the education that regarding to the green technology usage. For the government, they should conduct the green awareness campaign to the publics. They can promote the green awareness of green technology as the advertisements through the electronic media like television, radio and the other sources. Besides that, government can also make a banner that related to the effect of the usage of green technology

and placed it at the public location. Moreover, government is suggested to subsidize or tax exemption for the students to buy the green products since their financial capability is not allow them to buy the expensive green products.

Besides that, parents can also teach their children about the awareness of green technology and the usage of green technology. They should educated their children about the benefits of green technology that bring to the environment. So that, the children will appreciate the nature. Moreover, most of the children will follow what their parents do. Parents are the role model for their children. On the other hand, school, college or university should carry out a green technology course to the students especially the UUM students. After attended the green technology course, the students may learned the knowledge that regarding to the green technology, how the green technology protect the environment and what is the benefits of green technology to human being. Therefore, students are be aware of the green technology usage to the environment. Their attitude to the usage of green technology will also become better.

CONCLUSION

Based on this study, it can be concluded that the demographic, attitude and awareness are the factors that impact on the green technology usage. Based on the results, attitude among students of Bank Rakyat Student Residential Hall is more important than awareness in the usage of green technology. The attitude has a significant impact on green technology usage. Green Technology is an activity that creates and produces green and environmental friendly products and services. Based on the result of questionnaire, it shows that the students are willing to do the recycling. They are advice their family and friends to buy the environmental friendly products. They are also not mind to pick up the rubbish and throw it in the right place. Besides that, the 3R awareness is also important in order to reduce the waste and protect the environment. Moreover, since the amount of pollution in Malaysia is increasing in every year, therefore government was carry out the green awareness campaign to the publics. Those campaign is increase the environmental awareness among the publics. Therefore, they will do the activities that friendly to the environment in order to protect the nature.

REFERENCES

Allen, I. E., & Seaman, C. A. (2007, July). *Likert scales and data analyses.* Retrieved from Quality Progress: http://asq.org/quality-progress/2007/07/statistics/likert-scales-and-data-analyses.html

Bello Abdullahi Birchi. (2015). Assessing University Students' Attitude toward Green. *Proceedings of 2015 International Conference on Future Computational Technologies*, 27-33.

Bruin, J. (2011). Newtest: command to compute new test. *UCLA: Statistical Consulting Group*.

Chang, N. J., & Fong, C. M. (2010). Green product quality, green corporate image, green customer satisfaction, and green customer loyalty. *African Journal of Business Management, 4*(13), 2836-2844.

Figueredo, F. R., & Tsarenko, Y. (2013). Is "being green" a determinant of participation in university sustainability initiatives? *International Journal of Sustainability in Higher Education, 14*(3), 242-253.

Fisher, C., Bashyal, S., & Bachman, B. (2012). Demographic impacts on environmentally friendly purchase behaviors. *Journal of Targeting, Measurement and Analysis for Marketing, 20*(3/4), 172-184.

Hairazi Rahim., Mad Nasir Shamsudin., Alias Radam. & Zainal Abidin Mohamed. (2011). Relationships between attitude dimensions and the intention to purchase green food products among malaysian consumers. *Journal of Agribusiness Marketing, 4*, 51-67.

Hussain, M. (2012). Descriptive statistics - presenting your results 1. *Learning Research*, 741-743.

Jansson, J., Marell, A., & Nordlund, A. (2010). Green consumer behavior: determinants of curtailment and eco-innovation adoption. *Journal of Consumer Marketing, 27*(4), 358 - 370.

Kamaruddin Abu Bakar et. al. (2011). Green technology readiness in malaysia: sustainability for business development. *2nd International Conference on Business and Economics Research*, 1120-1129.

Khare, A. (2015). Antecedents to green buying behaviour: a study on consumers in an emerging economy. *Marketing Intelligence & Planning, 33*(3), 309-329.

Kumar, P., & Ghodeswar, B. M. (2015). Factors affecting consumers' green product purchase decision. *Marketing Intelligence & Planning, 33*(3), 330-347.

Mahmud Shah. (2011). Article: new green technology and its benefit. *MahmudShah's Weblog*.

Metz, K., & Seadle, M. (2012). Green publishing with green technologies. *Library Hi Tech, 30*(3), 381-383.

Ministry of Energy, Green Technology and Water. (2010). "Definition of green technology". Retrieved from www.gpnm.org/e/articles/Definition-of-Green-Technology-by-KETTHAMinistry-of-Energy-Green-Technology-and-Water-a5.html

Nameghi, E. N. M., & Shadi, M. A. (2013). Affective and cognitive: consumers attitude toward practicing green (reducing, recycling & reusing). *International Journal of Marketing Studies, 5*(1), 157-164.

Pastore, C. B. (2015). Why environmentally conscious consumers do not purchase green products. *Qualitative Market Research: An International Journal, 18*(2), 188-209.

Pedro, J., Luzio, P., & Lemke, F. (2013). Exploring green consumers' product demands and consumption processes: the case of portuguese green consumers. *European Business Review, 25*(3), 281-300.

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of shapiro-wilk, kolmogorov smirniv, lilliefors and anderson-darling tests. *Journal of Statistical Modeling and Analytics, 2*(1), 21-33.

Rezai, G., Phuah, K. T., Mohamed, Z., & Shamsudin, M. N. (2012). Consumers' awareness and consumption intention towards green foods. *African Journal of Business Management, 6*(12), 4496-4503.

Rossilawaty Sheriff & Musa Hassan. (2012). Television advertisement on recycle campaign: will the public be influenced? In *Communication and Environment Sustainability and Risks* (pp. 275-284).

Sinnappan, P., & Azmawani Abdul Rahman. (2011). Antecedents of green purchasing behavior among malaysian consumers. *International Business Management, 5*(3), 129-139.

Smith, E. E., & Perks, S. (2010). A perceptual study of the impact of green practice implementation on the business functions. *Southern African Business Review, 14*(3), 1-29.

Soni, G. D. (2015). Advantages of green technology. *International Journal of Research-Granthaalayah, 3*(9).

Sony, A., Ferguson, D., & Beise-Zee, R,. (2015). How to go green: unraveling green preferences of consumers. *Asia-Pacific Journal of Business Administration, 7*(1), 56-72.

Syed Ali Raza Hamid, Hateem Adnan Ghafoor, & Tamkeen Zehra Shah. (2012). Analysis of attitude towards green purchase: pakistan in context. *International Journal of Business and Social Science, 3*(6), 112-115.

Tan, B. C. & Lau, T. C. (2010). Attitude towards the environmental and green products: consumers' perspective. *Management Science and Engineering, 4*(2), 27-39.

Tang, Y. M., Wang, X. C., & Lu, P. P. (2014). Chinese consumer attitude and purchase intent towards green products. *Asia-Pacific Journal of Business Administration, 6*(2), 84-96.

Tavakol, M., & Dennick, R. (2011). Making sense of cronbach's alpha. *International Journal of Medical Education, 2*, 53-55.

Thogersen, J. e. (2015). Consumer buying motives and attitudes towards organic food in two emerging markets: china and brazil. *International Marketing Review, 32*(3/4), 389-413.

Tomohiro Tasaki, Hajime Yamakawa, & Daisuke Numata. (n.d.). Citizen attitude and policy for 3R behaviour in japan. *National Institute for Environmental Studies*.

Usman Aminu Umar, & Khamidi, M. F. (2012). Determined the Level of Green Building Public Awareness: Application and Strategies. *2012 International Conference on Civil, Offshore and Environmental Engineering*.

Vamsi, N., Jasti, K., Sharma, A., & Karinka, S. (2015). Development of a framework for green product development. *Benchmarking: An International Journal, 22*(3), 426-445.